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parent effect had been produced. The box was then closed and the exposure continued for another half hour. A careful examination at the end of this time led to the conclusion that no visible effect had been produced. It was found impracticable to continue the experiment longer, as the tube in this time had become excessively heated.

After the experiment was concluded the plants used were proved to be normally sensitive, as an exposure of one hour to diffused daylight, passed through a small horizontal slit, resulted in a noticeable curvature which in four hours had reached 60° from the vertical.

As the inductor was excited to its greatest capacity during the experiment, the plant being placed in as close proximity to the light as possible—and as after the experiment the plants were found to be normally sensitive, showing noticeable curvature on an equal exposure to diffuse white light—the author concludes that the new rays appear to differ from light in that they do not stimulate heliotropic curvature.

This contribution to our understanding of the action of the X-rays on plants is very interesting, but it is not thoroughly satisfactory. While light induces a noticeable curvature on certain plants in one hour, the X-rays may not be so active. Until it is possible to expose the plant to the action of the X-rays for a longer time we are not justified in concluding that they have no power to induce heliotropic curvature.

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CURRENT NOTES ON PHYSIOGRAPHY.

GREAT VALLEY OF CALIFORNIA.

F. L. Ransome discusses the heavy cover of fluviatile sediments, at least 2000 or 3000 feet thick, that form the floor of the Great Valley of California, in their bearing on the theory of isostacy (Bull. Dept. Geol., Univ. Cala., i, 1896, 371). Although chiefly concerned with geological problems, the essay gives a good general description of this typical fluviatile plain, dividing it into three sections, two of which are drained by the Sacramento and San Joaquin rivers, while the third sheds its waters into Tulare lake, of intermittent overflow. The great flat fans built forward by the larger streams from the Sierra are recognized as controlling the unsymmetrical position of the main rivers. The Sacramento and Feather rivers are said to 'pursue a winding course on low ridges;' this unsatisfactory and exaggerative term, 'low ridges,' being quoted from the Marysville folio, U. S. Geol. Atlas, to name the very faintly convex flood plains built by the rivers themselves. The smaller streams from the mountains "seldom reach the Sacramento directly, but are lost in the intricate plexus of sloughs which meander through the tule (reed) lands bordering the main river." A similar study of the Po in its relation to the Alps and Apennines would probably bring out many resemblances between these great fluviatile depositories of mountain waste.

NORWEGIAN COAST PLAIN.

An instructive account, by Richter, of his studies last summer concerns the Norwegian coast plain (Globus, lxix., 1896, 313), on which Reusch has already given a brief report (Norg. geol. Undersög., 1894, with map; Chicago Journ. Geol., ii., 1894, 347). The coast plain, not to be confused with ordinary coastal plains of uplifted marine sediments, is wave cut in solid rock with little regard to structure, and is terminated landward by an abrupt ascent to the highlands. The visible breadth of the plain varies greatly, depending first on its original exposure to the waves, and hence having greater expansion on the ocean front and weakening to a mere strandline or disappearing entirely in the fiords; second,

on its present attitude with respect to sea level, some broader parts rising 100 meters, others being entirely submerged. The open valleys of the interior, which are abruptly cut by the steep fiord walls, are referred to the same epoch and base-level as the coast plain. The plain was was made in preglacial time, and its uplifted surface is now much dissected. Richter emphasizes what Reusch said as to the important control exerted by the plain on the distribution of population and adds: "I regard this Norwegian coast plain as the greatest known example of well-proved marine erosion; perhaps the only one of so great dimensions in the world." The account is illustrated by four good views.

EQUATORIAL COUNTER CURRENTS.

A LARGE atlas issued last year by the Dutch Meteorological Institute at Utrecht, entitled 'De Guinea en Equatoriaal Stroomen,' clearly exhibits the periodic expansion of the Atlantic counter current in the northern summer; but unfortunately the area charted does not reach west far enough to take in the head of the current. From January to March, when the monsoon-like extension of the southeast trade across the equator as a south or southwest wind is practically wanting, the counter current is weak, irregular, and of small area. From July to September, when the southwest monsoon extends to 10° N. Lat. in mid-ocean, and even further north near the African coast, the counter current becomes definitely established between 4° and 9° or 11° N. Lat., with normal westward currents on either side. The strong temperature gradient on the northern border of the counter current near the African coast shows that it is not fed there by the North Atlantic eddy, as is represented on certain charts.

The January and July current charts in the atlas of the Pacific ocean lately issued by the Deutsche Seewarte (following similar atlases of the Atlantic and Indian oceans, with their sailing hand-books already published) gives additional confirmation of the control of equatorial counter currents by the monsoon-like extension of a trade wind across the equator into the summer hemisphere; first, by showing a great increase in the breadth of the counter current north of the equator in the chart for July, this being the only counter current ordinarily shown in the Pacific; second, by exhibiting in the chart for January a distinct counter current south of the equator in the western part of the ocean, about the Solomon islands, where alone in the Pacific the northeast trades cross the line into the southern hemisphere and blow for a time as north or northwest winds.

PLANETARY AND TERRESTRIAL CURRENTS.

THE current charts above referred to confirm the association of the general oceanic surface eddies with the change from day to night, the belt-like arrangement of the zones, the general circulation of the atmosphere, and the systematic deflections of the annual isotherms, as correlated features of a rotating, sun-lit, ocean- and air-bearing planet. Further, they confirm the association of faster currents (in temperate latitudes at least) in the winter hemisphere as well as of equatorial counter currents in the summer hemisphere, with the seasons and the migration of the isotherms, as well as marked characteristics of our own tilted-axis planet. Finally, they confirm the association of the irregular development of oceanic eddies and counter currents with the irregular outlines of the continents and oceans, and the various exaggerated deflections of the isotherms, as individual, non-geometrical features of the irregularly wrinkled earth. All this suggests a natural order of classification and presentation of these varied but related facts. It is the individual peculiarities of the lands and

waters that produce a broader counter current north than south of the equator in the Indian ocean, that limit the south counter of the Pacific to the western part of that ocean, and that exclude a south counter current entirely from the Atlantic.

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CURRENT NOTES ON METEOROLOGY.

THE CLIMATOLOGY OF MARYLAND.

A second edition of the Climatology of Maryland, originally published in 1894, has been issued as the *Second Biennial Report of the Maryland State Weather Service.* The data used in this compilation are the observations of the years 1892 to 1895, inclusive, and five charts accompany the report, showing the mean seasonal and mean annual precipitation and temperature. The Maryland Weather Service, organized in 1891, under the joint auspices of the Johns Hopkins University, the Maryland Agricultural College and the U. S. Weather Bureau—a very happy combination of elements— deserves great credit for the work it is doing for meteorology in the United States.

METEOROLOGICAL OBSERVATIONS IN SCHOOLS.

The Connecticut State Board of Education has issued a pamphlet on *Meteorological Observations in Schools* (Conn. School Doc. No. 10, 1896), which is intended to serve as an outline for the use of teachers who wish to give their scholars some practice in taking systematic meteorological observations of the simplest character. The time has come when some beginning in the teaching of meteorology in our schools should be made, and in order that such instruction may be systematic, and may serve as a basis for more advanced work in the later school years, an outline such as the present one is necessary. Teachers who are giving any attention to meteorology will find the pamphlet useful.

OTHER NOTEWORTHY PUBLICATIONS.

The following recent publications are worthy of note:

H. C. Russell: *A Map Showing the Average Monthly Rainfall in New South Wales.* (Read before the Royal Society of New South Wales, November 7, 1894.) The map shows, for each square degree of the Colony, the mean rainfall for every month.

Süring und Berson: *Die XV. Fahrt des Ballons 'Phönix' am 1 July, 1894.* (Zeitschr. f. Luftschiffahrt, February–March, 1896, 29–53.) An account of a balloon ascent to an altitude of 17,226 feet. Full meteorological observations were taken.

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SCIENTIFIC NOTES AND NEWS.

ASTRONOMY.

The Saxon Academy has recently published a paper by Dr. Bruno Peter, containing the results of his observations with the new Repsold heliometer of the Leipzig observatory. The paper contains an extensive investigation of the instrument and a determination of the parallaxes of three stars whose parallaxes had not previously been measured. The most interesting thing brought out in the investigation of the instrument is an experimental verification of the possibility of eliminating entirely the effects of a varying focal adjustment of the eye-piece by the use of certain peculiarly shaped diaphragms in front of the object glass. That this is possible had been previously suggested from theoretical considerations by Dr. Abbe, of Jena. The only point in which Dr. Peter's method of observation differs materially from that usually employed is in the determination of the error of runs separately for each observation, instead of employing a constant value for the night.

The parallax observations have been effected very nearly according to the program used by Gill. The results obtained are as follows:

	Parallax.	
Bradley 3077,	+0″.13	±0″.012
Arg.-Oeltz. 10603,	+0″.17	±0″.013
31 Aquilæ,	+0″.06	±0″.015